



Name:----- ID: -----

Answer the following questions: (The exam is in three pages and a table)

(Q1) (2 Points) MULTIPLE CHOICE: Choose the correct answer and fill in the following table (Only one choice)

1	2	3	4

- 1- Which rules for identifying unusual results by probabilities are correct?
- (a) If $P(x \text{ or more}) \leq 0.05$, then x is unusually low, if $P(x \text{ or fewer}) \leq 0.05$, then x is unusually high.
 - (b) If $P(x \text{ or more}) \leq 0.05$, then x is unusually high, if $P(x \text{ or fewer}) \leq 0.05$, then x is unusually low.
 - (c) If $P(x) \leq 0.05$, then x is unusual.
 - (d) If $P(x) = 0.05$, then x is unusual.
- 2- What is the meaning of the continuity correction?
- (a) Each whole number x in the binomial distribution is represented by the interval from $x - 0.5$ to $x + 0.5$.
 - (b) If the random variable is discrete, then after the correction it becomes continuous.
 - (c) It allows us to apply the Central Limit Theorem for small samples ($n \leq 30$).
 - (d) If a small sample is selected from a large population, then discrete data can be treated as continuous.
- 3- What is the meaning of the Central Limit Theorem?
- (a) The distribution of the sample mean \bar{x} will approach a normal distribution, as the sample size increases.
 - (b) The distribution of the population mean μ will approach a normal distribution, as the population size increases.
 - (c) The bell-shaped curve is symmetric about its center.
 - (d) The binomial distribution can be approximated by a normal distribution if $n > 30$.
- 4- In the following list, one random variable is discrete and three others are continuous. Which one is discrete?
- (a) The running time of a randomly selected movie.
 - (b) The height of a randomly selected person.
 - (c) The number of words of a randomly selected paragraph from a book.
 - (d) The weight of a randomly selected book.

P.T.O.

(Q2) (5 Points)

Listed below are the numbers of English words defined on 12 pages of a dictionary:

68 49 21 55 57 61 70 42 59 50 66 99

Find the following measures for this sample (round off to one decimal place):

- 1) Mean =
- 2) Median =
- 3) Range =
- 4) St. Deviation =
- 5) Variance =

Use the range rule of thumb to find the following (do not round off):

- 6) Minimal usual value =
- 7) Maximal usual value =
- 8) List all unusual values in this sample:

P.T.O.

(Q3) (3 points)

Assume that adults have IQ scores that are normally distributed with a mean of 90 and a standard deviation of 16. Answer the questions below by using the given Table.

(a) Find the probability that a randomly selected adult has an IQ greater than 88.

(b) Find the IQ score separating the bottom 5% from the top 95% of adults.

**Best Wishes
Areeg Abdalla**